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(54) A BEVERAGE DISPENSING SYSTEM

GETRÄNKEAUSGABESYSTEM

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Description

[0001] The present invention relates to a beverage dispensing system for dispensing cooled beverages, such as soft drinks, wine, cider or beer.

[0002] Beverage dispensing systems are known from, for example, EP 3 260 412 and WO 2005/106366. Over the last decades the dispensing systems have been designed for enhancing the taste experience of the beverage by, for instance, avoiding contamination of dispensing lines and other measures. However, the beverage dispensing systems have become more specialised and thereby as a consequence bulkier.

[0003] It is an object of the present invention to wholly or partly overcome the above disadvantages and drawbacks of the prior art. More specifically, it is an object to provide an improved beverage dispensing system having a flexible design without jeopardising the quality of the beverage to be dispensed and at the same time minimising the footprint of the system.

[0004] The above objects, together with numerous other objects, advantages and features, which will become evident from the below description, are accomplished by a solution in accordance with the present invention by a beverage dispensing system according to appended claim 1.

[0005] Hereby a flexible beverage dispensing system is obtained, wherein the cabinet may be used for other purposes as the cooling module may be detached easily from the cabinet. In addition, by applying the evaporator as a cooling jacket and using predominantly conductive heat transfer, it has the advantage that a standard cabinet may be used as housing for the beverage dispensing system without the need for insulated cooling chambers. Furthermore, a compact beverage dispensing system is obtained which do not occupy much room.

[0006] Furthermore, the evaporator may be a roll bond evaporator having one or more cooling agent channel(s) distributed along the extension of the evaporator. Hereby a flexible evaporator is obtained which may be formed according to the intended beverage container.

[0007] Moreover, the evaporator may have a cover made of polymeric material. Hereby easy cleaning of the evaporator and uniformly distributed low temperature of the evaporator surface is obtained. Additionally, the surface temperature on the polymeric cover is such that it prevents ice formation inside the beverage container and compensate for water anomaly at 4 degrees Celsius.

[0008] Advantageously, the components being connected with each other to form a single unit, which will facilitate attaching and detaching the cooling module in or from the inside of the cabinet.

[0009] In addition, the condensing unit and the control unit may be arranged inside a compartment. Preferably the compartment is liquid-tight so that the condensing unit and electronics may be protected from any beverage spill from the beverage container and/or condense from the evaporator, if any.

[0010] Furthermore, the cabinet may be an aircraft cabin service trolley, which ensures minimum footprint of the beverage dispensing system and maximum mobility. Also, by using an aircraft cabin service trolley, a new design for beverage dispensing systems have been obtained which is appealing to many, since the aircraft cabin service trolley is well known to many. However, due to the size of the aircraft cabin service trolleys the inventors have had to fully redesign especially the position of the different components of the cooling module.

[0011] To provide mobility of the beverage dispensing system, the cabinet may have wheels arranged below the bottom face.

[0012] Furthermore, the top face may have an opening, the tapping head is arranged opposite the opening.

[0013] For further providing flexibility to the beverage dispensing system the tapping head is detachable connected with the cabinet, so that it may be dismounted in periods where the beverage dispensing system is not in use.

[0014] The tapping head comprises a tower having an interior channel wherein the dispensing line can be guided from the beverage container to the tapping head.

[0015] The interior channel may have a size enabling the dispensing line to be guided through the interior channel, either from the tapping head or from the cabinet. This is especially advantageous in circumstances where the dispensing line is a one-way dispensing line which shall be replaced each time the beverage container is replaced. For instance, the beverage dispensing concept sold under the tradename FlexiDraft™ may be used together with the present invention.

[0016] Moreover, the tapping head may be connected with a plate, which plate may be arranged on the top face of the cabinet. This may also enhance the flexibility of the beverage dispensing system, while providing a support face and thereby stability to the tapping head. A further advantage is that the top face of the cabinet not necessarily needs to be reinforced. The plate may also have recesses to for instance a drip tray. Also, the plate may have substantially the same width as the cabinet.

[0017] The base plate may comprise one or more gaskets arranged around the edges of the base plate for increasing overall cabinet tightness.

[0018] Also, a plurality of fastening means may be arranged at the top face, the fastening means are configured to maintain the plate in position on the top face. Hereby is obtained a simple and flexible way to secure the plate, and thereby the tapping head to the top face of the cabinet.

[0019] Furthermore, the cabinet has internal walls, at least two opposite internal walls have a plurality of brackets arranged with a mutual distance from the bottom face to the top face.

[0020] In addition, the plate and the tapping head may be arranged inside the cabinet when not in use, wherein the plate is resting on two opposite brackets.

[0021] The plate and tapping head may be inverted

before being arranged inside the cabinet. Hereby the beverage dispensing system may be stored away when not in use in an easy manner, and at the same time ensuring that all the different components are protected inside the cabinet.

[0022] The beverage container may be made of metal or a polymeric material.

[0023] Advantageously, the cooling jacket may cover more than 60% of the outer face of the beverage container, preferably more than 70% of the outer face. Hereby the cooling capabilities of the cooling module is enhanced.

[0024] Moreover, the cooling jacket may have a form as a U or Ω when seen from a top view.

[0025] Furthermore, tensioning means may be arranged in connection with the cooling jacket, the tensioning means is/are configured to tightening the cooling jacket around the beverage container so that it is ensured that the cooling jacket is in good contact with the outer face of the beverage container so that the intended cooling of the beverage is obtained. Additionally, by using the tensioning means the beverage container is secured properly inside the cabinet.

[0026] The height of the cabinet may be at least substantially twice as large as the width of the cabinet.

[0027] Also, the height of the cabinet may be approximately 925 mm and the width of the cabinet is approximately 301 mm, which the standard measurements of an aircraft cabin service trolley.

[0028] In addition, the gas cylinder may be arranged in connection with the door.

[0029] Moreover, a gas regulator may be connected with the gas cylinder.

[0030] Furthermore, the cooling jacket may have a cooling face facing the outer face of the beverage container, a plurality of blocks is arranged on the cooling face so that thermal contact resistance between the beverage container and the cooling jacket of the evaporator is low. In addition, a gap between the cooling jacket of the evaporator and the beverage container are reduced.

[0031] The blocks may be made of metal, preferably aluminium.

[0032] Also, the blocks may be distributed so as to cover a major part of the cooling face.

[0033] In addition, a fan may be arranged inside the cabinet for providing airflow inside the cabinet.

[0034] A gasket strip may be arranged in connection with a door frame of the cabinet to increase cabinet tightness. Due to relatively high cabinet temperature, condensation on the door and the walls of the cabinet is avoided.

[0035] The base plate may substantially divide the cooling module with an insulated frame to avoid air circulation below the base plate.

[0036] The invention and its many advantages will be described in more detail below with reference to the accompanying schematic drawings, which for the purpose of illustration show some non-limiting embodiments and in which

Fig. 1 shows a beverage dispensing system according to the present invention,

Figs. 2-4 show the beverage dispensing system of Fig. 1 in different views,

Figs. 5-8 show the cooling module of the beverage dispensing system,

Figs. 9-10 show the beverage container positioned in the cabinet and the door closed, respectively,

Figs. 11-12 show the beverage dispensing system in a storage situation,

Fig. 13 shows a cross-sectional view of a beverage container having an extractor tube and a dispense head coupled to the extractor tube,

Fig. 14 shows an embodiment of a dispense head coupled to an extractor tube, and

Fig. 15 shows the beverage dispensing system of Fig. 1 with a beverage container arranged inside the cabinet.

[0037] All the figures are highly schematic and not necessarily to scale, and they show only those parts which are necessary in order to elucidate the invention, other parts being omitted or merely suggested.

[0038] Fig. 1 shows a beverage dispensing system 1 according to the present invention. The beverage dispensing system comprises a substantially closed cabinet 2 having a height, a width and a depth and a door 3 for providing access to an interior 4 of the cabinet 2. The cabinet 2 has a top face 5 and a bottom face 6. In the present embodiment the cabinet 2 is an aircraft cabin service trolley, which ensures minimum footprint of the beverage dispensing system and maximum mobility. Also, by using an aircraft cabin service trolley a new design for beverage dispensing systems have been obtained which is appealing to many, since the aircraft cabin service trolley is well known to many. However, due to the size of the aircraft cabin service trolleys, the inventors have had to fully redesign especially the position of the different components of the cooling module, which will be described further below. The present invention will be described and shown in an embodiment wherein the cabinet is the aircraft cabin service trolley however, the cabinet may have other forms and designs.

[0039] The beverage dispensing system also comprises a beverage container (not shown) having a cylindric form and an outer face, the beverage container containing a beverage to be dispensed. Furthermore, a dispense head (not shown) may be coupled to the beverage container, and a dispensing line (not shown) extending

from the dispense head to a tapping head 7. The dispensing line is configured to lead the beverage from the beverage container to the tapping head for dispensing, the tapping head 7 is arranged on the top face 5 of the cabinet 2.

[0040] Furthermore, a gas cylinder 8 having a gas, is fluidly connected with the dispense head for propelling the beverage out of the beverage container when the tapping head 7 is opened for dispensing.

[0041] The beverage dispensing system also comprises a cooling module 9 being detachable arranged inside the cabinet 2, the cooling module 9 being configured to cool the beverage contained in the beverage container. The cooling module 9 will be described further below.

[0042] For providing mobility to the beverage dispensing system 1, the cabinet 2 may have wheels 10 arranged below the bottom face 6.

[0043] Furthermore, the top face 5 may have an opening (not shown), the tapping head 7 is arranged opposite the opening. The dispensing line may extend from the interior of the cabinet up in the tapping head 7.

[0044] For further providing flexibility to the beverage dispensing system 1 the tapping head 7 may be detachable connected with the cabinet 2, so that it may be dismounted in periods where the beverage dispensing system 1 not is in use. This will further be described below in connection with Figs. 11-12.

[0045] The tapping head 7 may comprise a tower 11 having an interior channel (not shown) wherein the dispensing line can be guided from the beverage container to the tapping head 7.

[0046] The interior channel may have a size enabling the dispensing line to be guided through the interior channel, either from the tapping head or from the cabinet. This is especially advantageous in circumstances where the dispensing line is a one-way dispensing line which shall be replaced each time the beverage container is replaced. For instance, the beverage dispensing concept sold under the tradename FlexiDraft™ may be used together with the present invention. WO 2013/000932 is incorporated by reference.

[0047] The tapping head 7 is connected with a plate 12, which plate 12 is arranged on the top face 5 of the cabinet 2. This may also enhance the flexibility of the beverage dispensing system 1, while providing a support face and thereby stability to the tapping head 7. A further advantage is that the top face 5 of the cabinet not necessarily needs to be reinforced. The plate may be also have recesses to for instance a drip tray 13. Also, the plate 12 may have substantially the same width as the cabinet.

[0048] In Fig. 2 the beverage dispensing system 1 is shown in a front view with the door 3 open. The cabinet 2 having a height H and a width W as well as a depth D (shown in Fig. 3). The height H of the cabinet 2 may be at least substantially twice as large as the width W of the cabinet 2 as shown in Fig. 2.

[0049] Also, the height H of the cabinet may be approximately 925 mm and the width W of the cabinet is approximately 301 mm, which the standard measurement of an aircraft cabin service trolley.

[0050] As shown in Fig. 2 the cabinet 2 has internal walls 14, at least two opposite internal walls 14 have a plurality of brackets 15 arranged with a mutual distance from the bottom face 6 to the top face 5.

[0051] In the present embodiment the gas cylinder 8 is arranged in connection with the door 3. The gas cylinder 8 is connected with a gas regulator 16 being configured to provide the intended gas pressure to the beverage container for propelling the beverage out of the beverage container.

[0052] In Fig. 3 the beverage dispensing system 1 is shown in a side view.

[0053] In Fig. 4 the beverage dispensing system 1 is shown in a top view.

[0054] Figs. 5-8 show the cooling module 9. In Fig. 5 the cooling module 9 is shown in perspective. In Fig. 6 the cooling module 9 is shown in a top view. In Fig. 7 the cooling module 9 is shown in a front view and Fig. 8 is a side view of the cooling module 9. The cooling module 9 comprises the following components an evaporator 17 formed as a cooling jacket 18, the cooling jacket 18 is configured to partly encircle the beverage container (not shown) and being in contact with the outer face of the beverage container for cooling the beverage. The outer face is the lateral face of the beverage container.

[0055] The cooling module 9 also comprises a base plate 19 whereupon the beverage container is to be arranged and a temperature sensor 20 being arranged to be in contact with the outer face of the beverage container, the temperature sensor 20 being operatively connected with a control device 21. Risk of beverage freezing is mitigated by using a temperature control that has as input signal from the temperature sensor which is in direct contact with the beverage container. The temperature control has embedded parameters that together with the system design allow tuning in such a way that that the beverage will not freeze.

[0056] Furthermore, the cooling module comprises a condensing unit 22 comprising a compressor 23, a condenser 24 and an expansion device (not shown), the condensing unit 22 is configured to cool a cooling agent, and to circulate the cooling agent for cooling the cooling jacket 18. The condensing unit 22 and the control device 21 are arranged below the base plate.

[0057] Hereby a flexible beverage dispensing system 1 is obtained, wherein the cabinet 2 may be used for other purposes as the cooling module 1 may be detached easily from the cabinet 2. In addition, by applying the evaporator 17 as a cooling jacket and using predominantly conductive heat transfer it has the advantage that a standard cabinet may be used as housing for the beverage dispensing system 1 without the need for insulated cooling chambers.

[0058] Furthermore, the evaporator 17 may be a roll bond evaporator having one or more cooling agent chan-

nel(s) distributed along the extension of the evaporator 17. Hereby a flexible evaporator 17 is obtained which may be formed according to the intended beverage container.

[0059] Moreover, the evaporator 17 may have a cover made of polymeric material. Hereby easy cleaning of the evaporator 17 and uniform distributed low temperature of the evaporator surface is obtained. Additionally, the temperature on the polymeric cover is such that it prevents ice formation inside the beverage container and compensate for water anomaly at 4 degrees Celsius.

[0060] Advantageously, the components of the cooling module 9 being connected with each other to form a single unit will facilitate attaching and detaching the cooling module 9 in or from the inside of the cabinet.

[0061] In addition, the condensing unit 22 and the control unit 21 may be arranged inside a compartment 26. Preferably the compartment 26 is liquid-tight so that the condensing unit 22 and electronics in form of the control unit may be protected from any beverage spill from the beverage container and/or condense from the evaporator 17, if any.

[0062] The base plate 19 may be arranged with a small inclination, preferably below 3 degrees so that if any liquid is ending up on the base plate it may be directed in a condense tray 39 located inside the condensing unit. The condense tray 39 is shown in Fig. 8

[0063] In addition, the base plate has an edge around the perimeter of the base plate. One or more gaskets may be arranged at the edge for increasing cabinet tightness by avoiding fluid communication between an evaporator space and a condensing unit space.

[0064] Advantageously, the cooling jacket 18 may cover more than 60% of the outer face of the beverage container, preferably more than 70% of the outer face. Hereby the cooling capabilities of the cooling module 9 is enhanced.

[0065] Moreover, the cooling jacket 18 may have a form as a U or Ω when seen from a top view as shown in Fig. 6.

[0066] Furthermore, the cooling jacket 18 may have a cooling face 27 facing the outer face of the beverage container, a plurality of blocks 28 is arranged on the cooling face 27 so that thermal contact resistance between the beverage container and the cooling jacket 18 of the evaporator 17 is low. In addition, a gap between the cooling jacket 18 of the evaporator 17 and the beverage container is reduced.

[0067] The blocks 28 may be made of metal, preferably aluminium.

[0068] Also, the blocks 28 may be distributed so as to cover a major part of the cooling face 27.

[0069] In addition, a fan may be arranged inside the cabinet for providing airflow inside the cabinet.

[0070] In addition, a gasket strip may be arranged in connection with a door frame of the cabinet to increase cabinet tightness. Due to relatively high cabinet temperature, condensation on the door and the walls of the cabinet is avoided.

[0071] The base plate 19 may substantially divide the cooling module 9 with an insulated frame to avoid air circulation below the base plate 9.

[0072] In Fig. 9 a beverage container 29 is arranged inside the cabinet 2 of the beverage dispensing system 1. The beverage container 29 is placed on the base plate 19 and is encircled by the evaporator.

[0073] Furthermore, tensioning means 30 is/are arranged in connection with the cooling jacket, the tensioning means 30 is/are configured to tightening the cooling jacket around the beverage container 29 as seen in Fig. 9 so that it is ensured that the cooling jacket is in good contact with the outer face 31 of the beverage container 29 so that the intended cooling of the beverage is obtained. Additionally, by using the tensioning means 30 the beverage container is secured properly inside the cabinet. The tensioning means 30 are in the present embodiment a strap in each end being connected with the cooling jacket.

[0074] The beverage container 29 may be made of metal or a polymeric material.

[0075] In Fig. 10 the beverage container system 1 is shown with the door 3 closed. As mentioned above, the plate 12 is arranged on the top face of the cabinet 2. A plurality of fastening means 32 is arranged at the top face, the fastening means 32 are configured to maintain the plate 12 in position on the top face. Hereby a simple and flexible way to secure the plate 12 is obtained and thereby the tapping head 7 to the top face of the cabinet.

[0076] In Figs. 11 and 12 the cabinet 2 is shown in a storage position meaning the tapping head has been demounted from the cabinet 2. In Fig. 11 the door 3 is closed so that the interior of the cabinet 2 is closed too.

[0077] In Fig. 12 the door 3 is open whereby it is possible to see the plate 12 and the tapping head 7 arranged inside the cabinet 2 when not in use. The plate 12 is resting on two opposite brackets 15.

[0078] In the present embodiment, the plate 12 and tapping head 7 have been inverted before being arranged inside the cabinet 2. Hereby the beverage dispensing system 1 may be stored away when not in use in an easy manner and at the same time ensuring that all the different components are protected inside the cabinet. Hence, when not in use the tapping head and plate are fitted inside the cabinet. The advantage is that the cabinet in the design as an aircraft cabin service trolley appears to be only a trolley and not a beverage dispensing system.

[0079] Fig. 13 shows a cross-sectional view of a beverage container 29 having an extractor tube 33 or spear arranged in a collar 33 of the beverage container 29 and a dispense head 35 coupled to the extractor tube 33. The extractor tubes and dispense heads are well known as well as their function, hence it will not be described in detail here. The dispense head 35 has a gas inlet 36 which is fluidly connected with the gas cylinder (not shown). Furthermore, the dispensing line 37 is fluidly

connected with the dispense head 37. In the present embodiment the dispensing line 37 comprises a probe 38 which may be inserted into a bore in the dispense head 35. The probe is used to activate a double valve of the extractor tube. The probe and the dispensing line are in the present embodiment configured to be replaced each time the beverage container is replaced. Hence both the probe and the dispensing line may be made of polymeric materials and may be disposed after use.

[0080] Fig. 14 shows an embodiment of a dispense head 35 coupled to an extractor tube 33, the dispensing line 37 is connected with the dispense head 35 as mentioned above. Since many different systems of beverage containers, extractor tubes/spears, and thereby also dispense heads to be coupled to the extractor tubes exist, the present invention may be used with any of the known systems, and they will consequently not be described any further here. The embodiment shown in Fig. 14 is only one example of the dispense head which may be used in connection with the present invention.

[0081] Fig. 15 shows the beverage dispensing system 1 of Fig. 1 with a beverage container 29 arranged inside the cabinet 2. The beverage dispensing system 1 is shown in a front view.

[0082] As mentioned above, the beverage dispensing system 1 comprises a beverage container 29 having a cylindric form and an outer face 31, the beverage container 29 containing a beverage to be dispensed. Furthermore, a dispense head 35 is coupled to the beverage container 29, and a dispensing line 37 is extending from the dispense head 35 to a tapping head 7. The tapping head 7 comprises a tower 11 which in Fig. 15 has a cut out so that the dispensing line 37 placed in the interior channel 40 is shown.

[0083] The dispensing line 37 is configured to lead the beverage from the beverage container 29 to the tapping head 7 for dispensing, the tapping head 7 is arranged on the top face of the cabinet 2. The tapping head 7 comprises a tapping handle 41 for opening and closing the dispensing of beverage of the spout 42.

[0084] Furthermore, a gas cylinder 8 having a gas, is fluidly connected with the dispense head 35 for propelling the beverage out of the beverage container 29 when the tapping head 7 is opened for dispensing.

[0085] The beverage dispensing system also comprises a cooling module 9 being detachable arranged inside the cabinet 2, the cooling module 9 being configured to cool the beverage contained in the beverage container.

[0086] Even though the present invention has been described in connection with one cooling module inserted into one cabinet, several cooling modules may be arranged inside a cabinet whereby it is possible to cool a number of beverage containers in the same cabinet with the different beverage containers having different intended dispensing temperatures. Hence by the cooling modules it would be possible to cool different beverage containers, and thereby the beverages in them, independently of each other.

[0087] Although the invention has been described in the above in connection with preferred embodiments of the invention, it will be evident for a person skilled in the art that several modifications are conceivable without departing from the invention as defined by the following claims.

Claims

1. A beverage dispensing system (1), comprising

a substantially closed cabinet (2) having a height H, a width W and a depth D and a door (3) for providing access to an interior (4) of the cabinet (2), the cabinet has a top face (5) and a bottom face (6),

a beverage container (29) having a cylindric form and an outer face (31), the beverage container containing a beverage to be dispensed,

a dispense head (35) to be coupled to the beverage container, and a dispensing line (37) extending from the dispense head to a tapping head (7), the dispensing line is configured to lead the beverage from the beverage container to the tapping head for dispensing, the tapping head is arranged on the top face (5) of the cabinet,

a gas cylinder (8) having a gas, is fluidly connected with the dispense head for propelling the beverage out of the beverage container when the tapping head is opened for dispensing,

wherein a cooling module (9) is detachable arranged inside the cabinet (2), the cooling module (9) being configured to cool the beverage contained in the beverage container, the cooling module comprises the following components

- an evaporator (17) formed as a cooling jacket (18), the cooling jacket is configured to partly encircle the beverage container and being in contact with the outer face (31) of the beverage container for cooling the beverage,
- a base plate (19) whereupon the beverage container is to be arranged,
- a temperature sensor (20) being arranged to be in contact with the outer face of the beverage container, the temperature sensor being operatively connected with a control device (21), and
- a condensing unit (22) comprising a compressor (23), a condenser (24) and an expansion device, the condensing unit (22) is configured to decrease a temperature of a cooling agent, and to circulate the cooling agent for cooling the cooling jacket (18), the

condensing unit (22) and the control device (21) is arranged below the base plate (19), wherein tapping head (7) is detachable connected with the cabinet (2) and comprises a tower (11) having an interior channel in which the dispensing line can be guided from the beverage container to the tapping head.

2. A beverage dispensing system (1) according to claim 1, wherein the evaporator (17) is a roll bond evaporator having a cooling agent channel distributed along the extension of the evaporator.

3. A beverage dispensing system (1) according to any of the preceding claims, wherein the evaporator (17) has a cover made of polymeric material.

4. A beverage dispensing system (1) according to any of the preceding claims, wherein the components being connected with each other forming a single unit.

5. A beverage dispensing system (1) according to any of the preceding claims, wherein the cabinet (2) is an aircraft cabin service trolley.

6. A beverage dispensing system (1) according to any of the preceding claims. wherein the tapping head (7) is connected with a plate (12), which plate may be arranged on the top face (5) of the cabinet.

7. A beverage dispensing system (1) according to any of the preceding claims, wherein the cabinet (2) has internal walls (14), at least two opposite internal walls (14) have a plurality of brackets (15) arranged with a mutual distance from the bottom face to the top face.

8. A beverage dispensing system (1) according to claim 7, wherein the plate (12) and the tapping head (7) may be arranged inside the cabinet (2) when not in use, wherein the plate (12) is resting on two opposite brackets (15).

9. A beverage dispensing system (1) according to any of the preceding claims, wherein the cooling jacket (18) covers more than 60% of the outer face of the beverage container, preferably more than 70% of the outer face.

10. A beverage dispensing system (1) according to any of the preceding claims, wherein tensioning means (30) is/are arranged in connection with the cooling jacket (18), the tensioning means is/are configured to tightening the cooling jacket around the beverage container so that it is ensured that the cooling jacket is in contact with the outer face of the beverage container.

11. A beverage dispensing system (1) according to any of the preceding claims, wherein the height H of the cabinet (2) is at least substantially twice as large as the width W of the cabinet (2).

12. A beverage dispensing system (1) according to any of the preceding claims, wherein the gas cylinder (8) is arranged in connection with the door (3).

13. A beverage dispensing system (1) according to any of the preceding claims, wherein the cooling jacket (18) has a cooling face (27) facing the outer face (31) of the beverage container, a plurality of blocks (28) is arranged on the cooling face so that thermal contact resistance between the beverage container (29) and the cooling jacket (18) of the evaporator (17) is low.

Patentansprüche

1. Getränkeausgabesystem (1), umfassend

ein im Wesentlichen geschlossenes Gehäuse (2), das eine Höhe H, eine Breite W und eine Tiefe D und eine Tür (3) zum Bereitstellen von Zugang zu einem Inneren (4) des Gehäuses (2) aufweist, wobei das Gehäuse eine obere Fläche (5) und eine Bodenfläche (6) aufweist,
einen Getränkebehälter (29), der eine Zylinderform und eine Außenfläche (31) aufweist, wobei der Getränkebehälter ein Getränk beinhaltet, das auszugeben ist,
einen Ausgabekopf (35), der mit dem Getränkebehälter zu koppeln ist, und eine Ausgabeleitung (37), die sich von dem Ausgabekopf zu einem Zapfkopf (7) erstreckt, wobei die Ausgabeleitung dazu konfiguriert ist, das Getränk von dem Getränkebehälter zu dem Zapfkopf zum Ausgeben zu führen, wobei der Zapfkopf an der oberen Fläche (5) des Gehäuses angeordnet ist,
eine Gasflasche (8), die ein Gas aufweist und mit dem Ausgabekopf zum Befördern des Getränks aus dem Getränkebehälter fluidverbunden ist, wenn der Zapfkopf zum Ausgeben geöffnet wird,
wobei ein Kühlmodul (9) abnehmbar innerhalb des Gehäuses (2) angeordnet ist, wobei das Kühlmodul (9) dazu konfiguriert ist, das Getränk zu kühlen, das in dem Getränkebehälter beinhaltet ist, wobei das Kühlmodul die folgenden Komponenten umfasst:

- einen Verdampfer (17), der als ein Kühlmantel (18) gebildet ist, wobei der Kühlmantel dazu konfiguriert ist, den Getränkebehälter teilweise zu umgeben und in Kontakt mit der Außenfläche (31) des Getränkebe-

hälters zum Kühlen des Getränks zu stehen,
- eine Basisplatte (19), auf welcher der Getränkebehälter anzuordnen ist,
- einen Temperatursensor (20), der dazu angeordnet ist, in Kontakt mit der Außenfläche des Getränkebehälters zu stehen, wobei der Temperatursensor mit einer Steuervorrichtung (21) wirkverbunden ist, und
- eine Kondensationseinheit (22), umfassend einen Kompressor (23), einen Kondensator (24) und eine Expansionsvorrichtung, wobei die Kondensationseinheit (22) dazu konfiguriert ist, eine Temperatur eines Kühlmittels zu verringern und das Kühlmittel zum Kühlen des Kühlmantels (18) umzuwälzen, wobei die Kondensationseinheit (22) und die Steuervorrichtung (21) unterhalb der Basisplatte (19) angeordnet ist,

wobei der Zapfkopf (7) abnehmbar mit dem Gehäuse (2) verbunden ist und einen Turm (11) umfasst, der einen Innenkanal aufweist, in welchem die Ausgabeleitung von dem Getränkebehälter zu dem Zapfkopf geleitet werden kann.

2. Getränkeausgabesystem (1) nach Anspruch 1, wobei es sich bei dem Verdampfer (17) um einen Roll-Bond-Verdampfer handelt, der einen Kühlmittelkanal aufweist, der entlang der Erstreckung des Verdampfers verteilt ist.

3. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei der Verdampfer (17) eine Abdeckung aufweist, die aus polymerem Material hergestellt ist.

4. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei die Komponenten, die miteinander verbunden sind, eine einzige Einheit bilden.

5. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei es sich bei dem Gehäuse (2) um einen Luftfahrzeugkabinenservierwagen handelt.

6. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei der Zapfkopf (7) mit einer Platte (12) verbunden ist, wobei die Platte an der oberen Fläche (5) des Gehäuses angeordnet sein kann.

7. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei das Gehäuse (2) Innenwände (14) aufweist, wobei mindestens zwei gegenüberliegende Innenwände (14) eine Vielzahl von Halterungen (15) aufweisen, die mit einem gegenseitigen Abstand von der Bodenfläche zu der oberen Fläche angeordnet ist.

8. Getränkeausgabesystem (1) nach Anspruch 7, wobei die Platte (12) und der Zapfkopf (7) bei Nichtgebrauch innerhalb des Gehäuses (2) angeordnet werden können, wobei die Platte (12) auf zwei gegenüberliegenden Halterungen (15) ruht.

9. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei der Kühlmantel (18) mehr als 60 % der Außenfläche des Getränkebehälters, vorzugsweise mehr als 70 % der Außenfläche, bedeckt.

10. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei ein oder mehrere Spannmittel (30) in Verbindung mit dem Kühlmantel (18) angeordnet ist/sind, wobei das/die Spannmittel dazu konfiguriert ist/sind, den Kühlmantel um den Getränkebehälter herum festzuziehen, so dass sichergestellt wird, dass der Kühlmantel in Kontakt mit der Außenfläche des Getränkebehälters steht.

11. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei die Höhe H des Gehäuses (2) mindestens im Wesentlichen doppelt so groß wie die Breite W des Gehäuses (2) ist.

12. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei die Gasflasche (8) in Verbindung mit der Tür (3) angeordnet ist.

13. Getränkeausgabesystem (1) nach einem der vorstehenden Ansprüche, wobei der Kühlmantel (18) eine Kühlfläche (27) aufweist, die der Außenfläche (31) des Getränkebehälters zugewandt ist, wobei eine Vielzahl von Blöcken (28) auf der Kühlfläche angeordnet ist, so dass der thermische Kontaktwiderstand zwischen dem Getränkebehälter (29) und dem Kühlmantel (18) des Verdampfers (17) gering ist.

Revendications

1. Système de distribution de boissons (1), comprenant

une armoire sensiblement fermée (2) ayant une hauteur H, une largeur W et une profondeur D et une porte (3) pour donner accès à un intérieur (4) de l'armoire (2), l'armoire a une face supérieure (5) et une face inférieure (6),
un récipient à boisson (29) ayant une forme cylindrique et une face extérieure (31), le récipient à boisson contenant une boisson à distribuer,

une tête de distribution (35) à coupler au récipient de boisson, et une conduite de distribution (37) s'étendant de la tête de distribution à une tête de taraudage (7), la conduite de distribution est configurée pour conduire la boisson du récipient de boisson à la tête de taraudage pour la distribution, la tête de taraudage est disposée sur la face supérieure (5) de l'armoire,
une bouteille de gaz (8) contenant un gaz est reliée fluidiquement à la tête de distribution pour propulser la boisson hors du récipient à boisson lorsque la tête de taraudage est ouverte pour la distribution,
dans lequel un module de refroidissement (9) est amovible et disposé à l'intérieur de l'armoire (2), le module de refroidissement (9) étant configuré pour refroidir la boisson contenue dans le récipient à boisson, le module de refroidissement comprend les composants suivants

- un évaporateur (17) formé comme une chemise de refroidissement (18), la chemise de refroidissement est configurée pour entourer partiellement le récipient de boisson et étant en contact avec la face extérieure (31) du récipient de boisson pour refroidir la boisson,
- une plaque de base (19) sur laquelle doit être disposé le récipient à boisson,
- un capteur de température (20) disposé de manière à être en contact avec la face extérieure du récipient à boisson, le capteur de température étant connecté de manière fonctionnelle à un dispositif de commande (21), et
- une unité de condensation (22) comprenant un compresseur (23), un condenseur (24) et un dispositif de détente, l'unité de condensation (22) étant configurée pour diminuer la température d'un agent de refroidissement et pour faire circuler l'agent de refroidissement afin de refroidir la chemise de refroidissement (18), l'unité de condensation (22) et le dispositif de commande (21) étant disposés sous la plaque de base (19),

dans lequel la tête de taraudage (7) est détachable et reliée à l'armoire (2) et comprend une tour (11) ayant un canal intérieur dans lequel la ligne de distribution peut être guidée du récipient à boisson à la tête de taraudage.

2. Système de distribution de boissons (1) selon la revendication 1, dans lequel l'évaporateur (17) est un évaporateur à tubes intégrés comportant un canal d'agent de refroidissement distribué le long de l'extension de l'évaporateur.

3. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel l'évaporateur (17) comporte un couvercle en matériau polymère.

4. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel les composants sont connectés les uns aux autres pour former une seule unité.

5. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel l'armoire (2) est un chariot de service de cabine d'avion.

6. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel la tête de taraudage (7) est reliée à une plaque (12), laquelle plaque peut être disposée sur la face supérieure (5) de l'armoire.

7. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel l'armoire (2) comporte des parois internes (14), au moins deux parois internes opposées (14) comportant une pluralité de supports (15) disposés avec une distance mutuelle de la face inférieure à la face supérieure.

8. Système de distribution de boissons (1) selon la revendication 7, dans lequel la plaque (12) et la tête de taraudage (7) peuvent être disposées à l'intérieur de l'armoire (2) lorsqu'elles ne sont pas utilisées, la plaque (12) reposant sur deux supports opposés (15).

9. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel la chemise de refroidissement (18) recouvre plus de 60 % de la face extérieure du récipient à boisson, de préférence plus de 70 % de la face extérieure.

10. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel des moyens de tension (30) sont disposés en liaison avec la chemise de refroidissement (18), les moyens de tension sont configurés pour serrer la chemise de refroidissement autour du récipient à boisson de sorte qu'il soit assuré que la chemise de refroidissement est en contact avec la face extérieure du récipient à boisson.

11. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel la hauteur H de l'armoire (2) est au moins sensiblement deux fois plus grande que la largeur W de l'armoire (2).

12. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel la bouteille de gaz (8) est disposée en liaison avec la porte (3).

13. Système de distribution de boissons (1) selon l'une quelconque des revendications précédentes, dans lequel la chemise de refroidissement (18) a une face de refroidissement (27) faisant face à la face extérieure (31) du récipient à boisson, une pluralité de blocs (28) sont disposés sur la face de refroidissement de sorte que la résistance de contact thermique entre le récipient à boisson (29) et la chemise de refroidissement (18) de l'évaporateur (17) est faible.

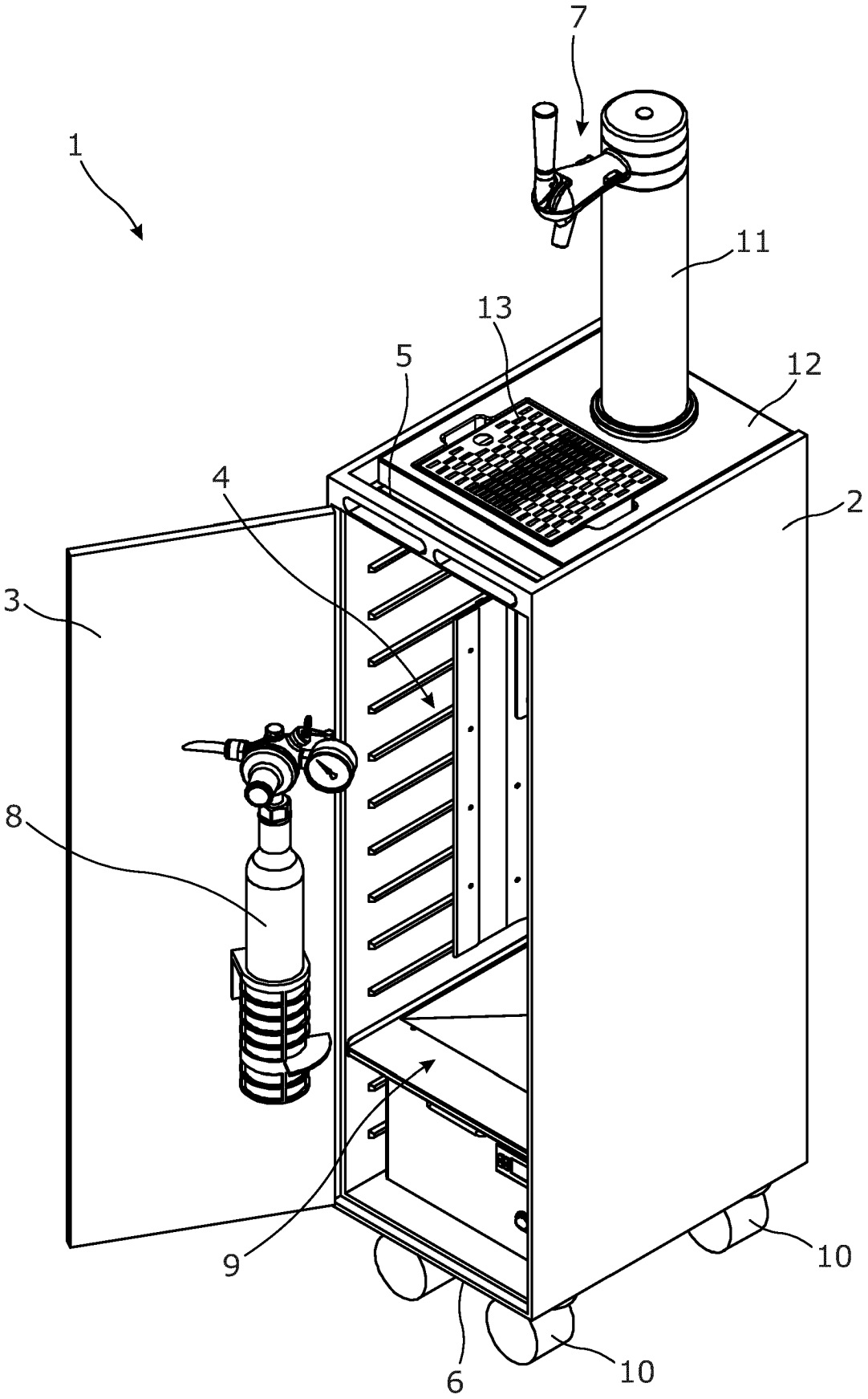

Fig. 1

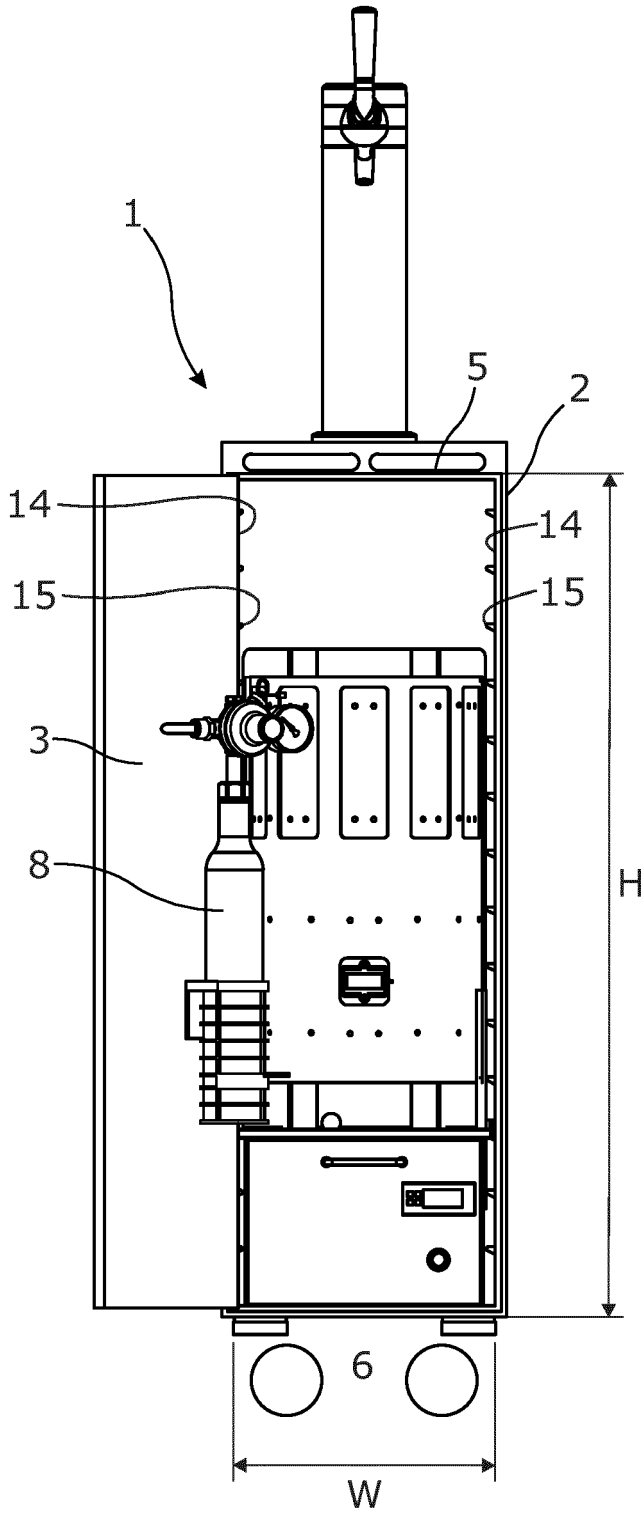

Fig. 2

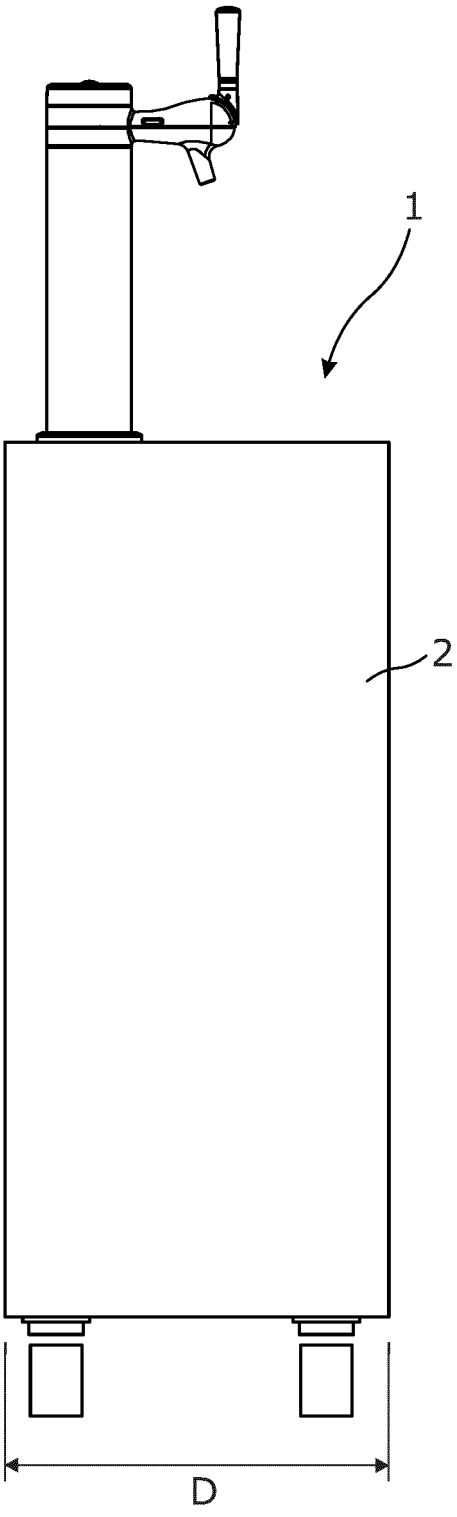

Fig. 3

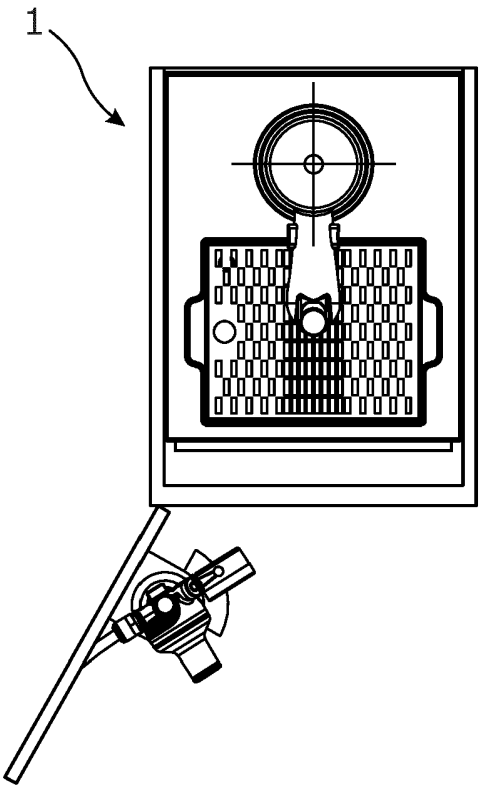

Fig. 4

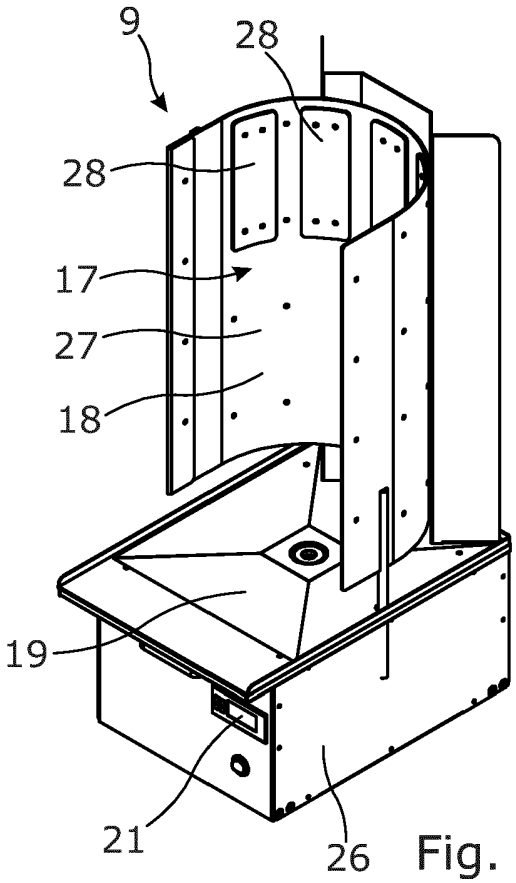

Fig. 5

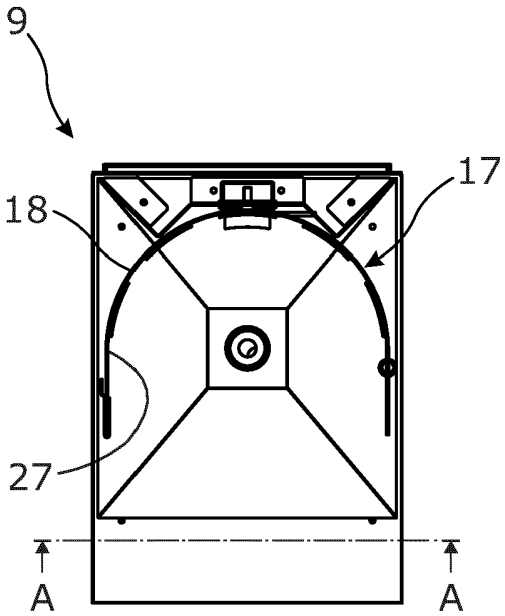

Fig. 6

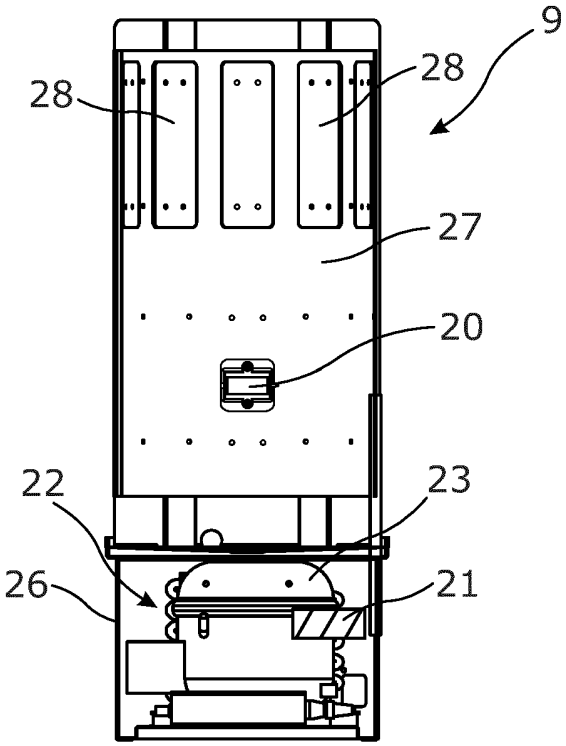

Fig. 7

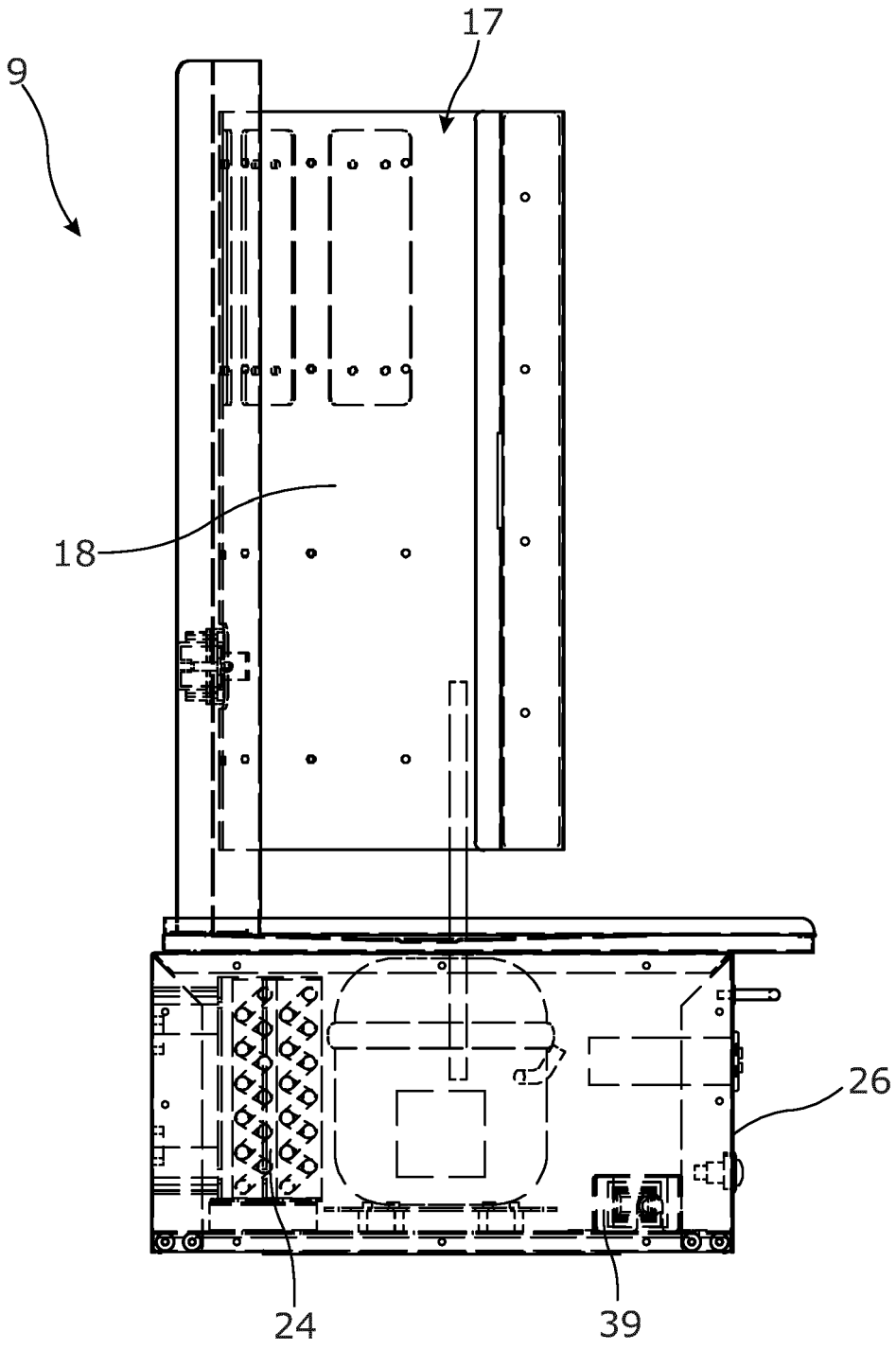

Fig. 8

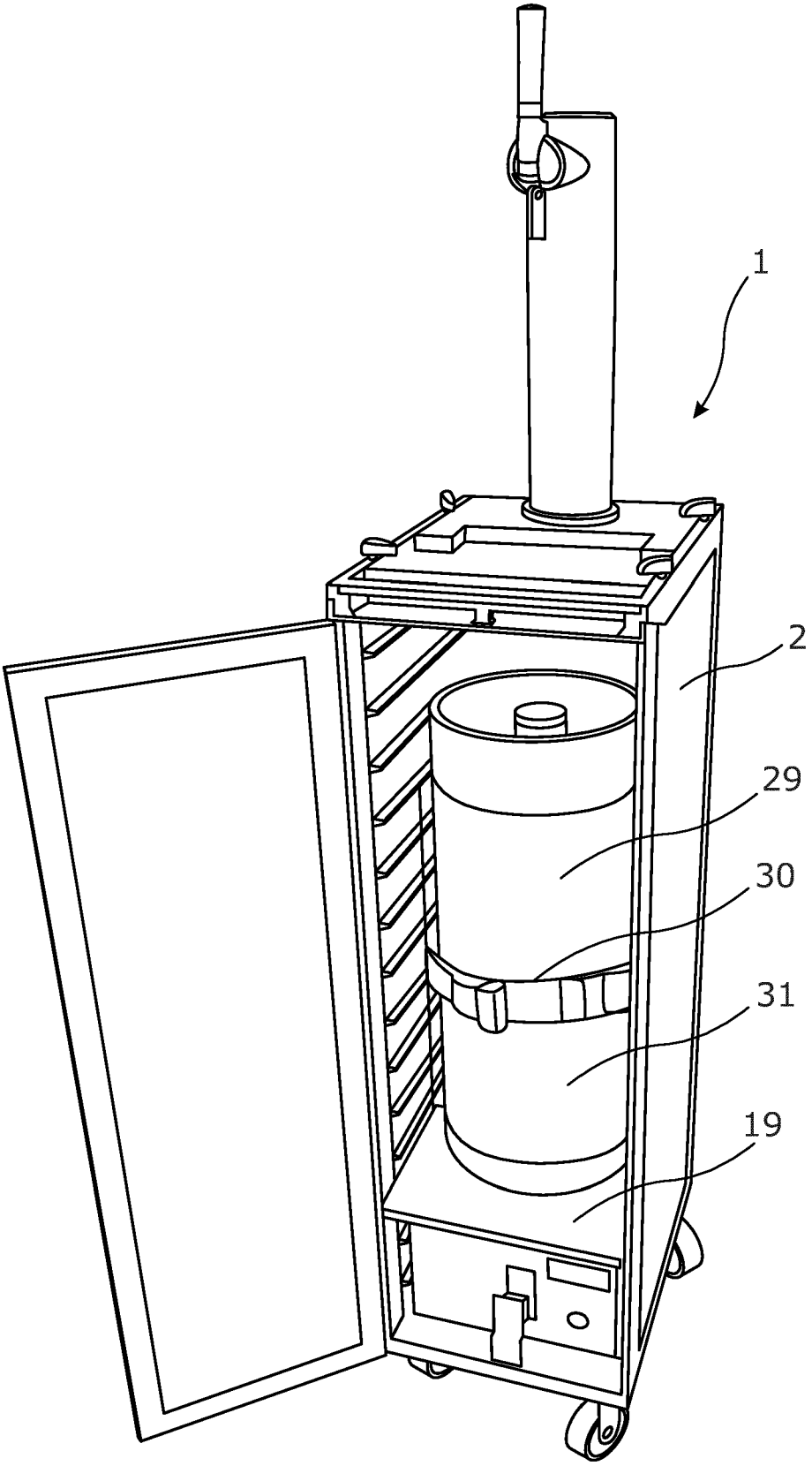

Fig. 9

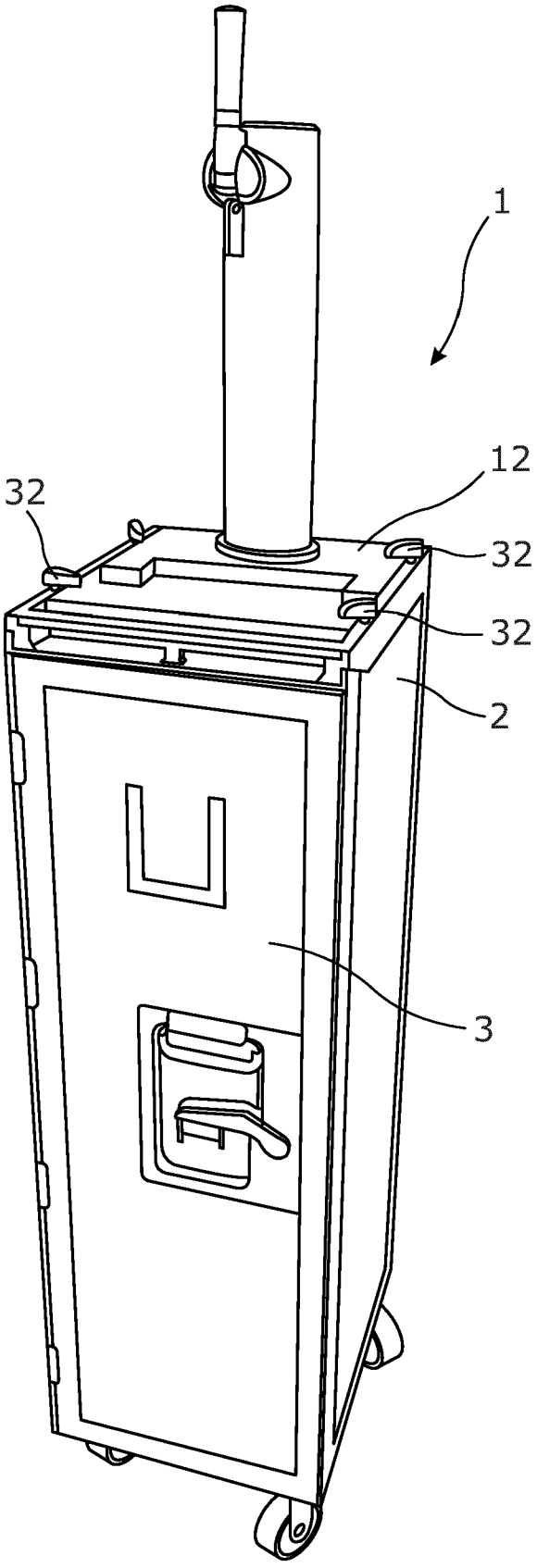

Fig. 10

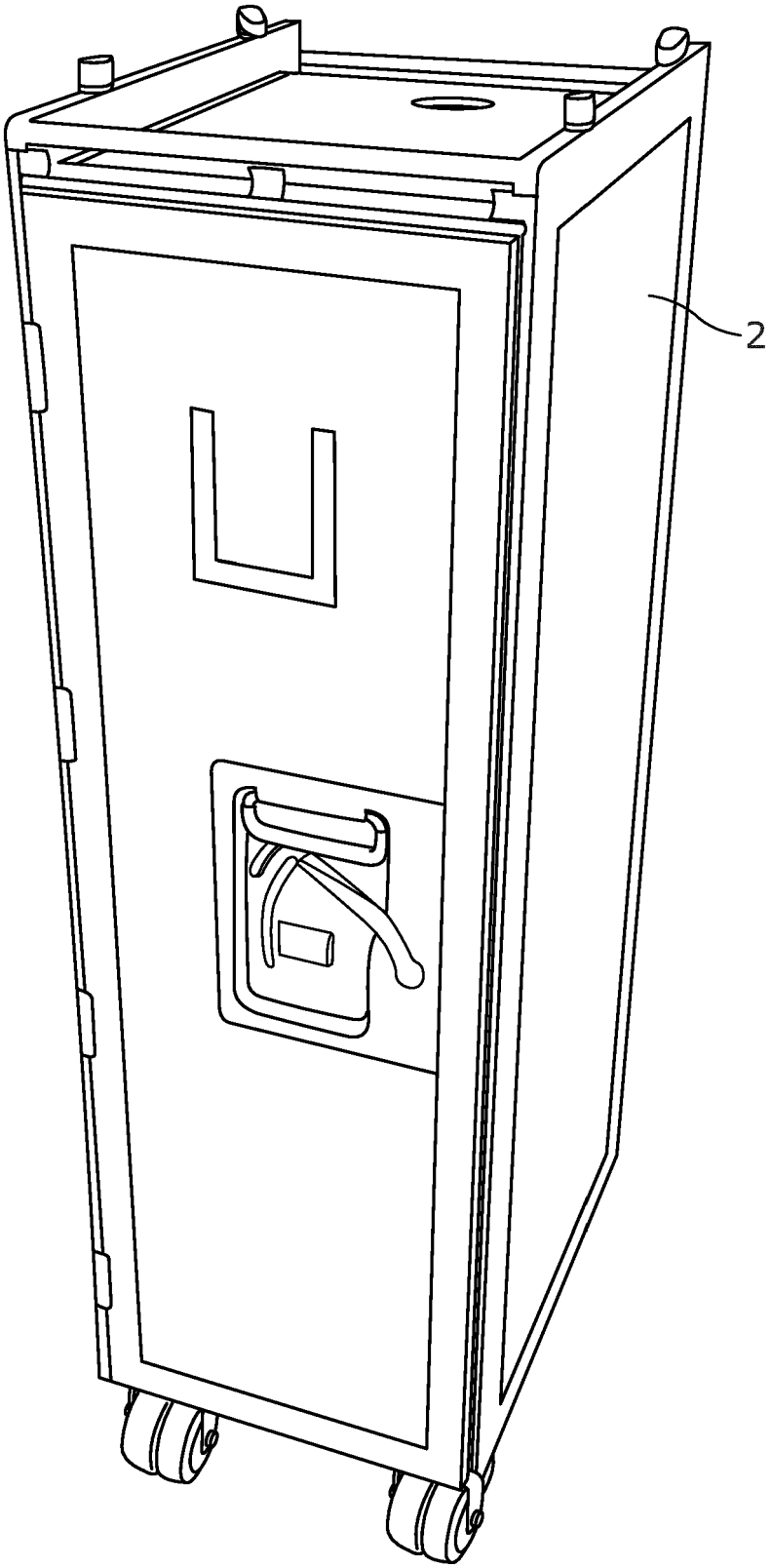

Fig. 11

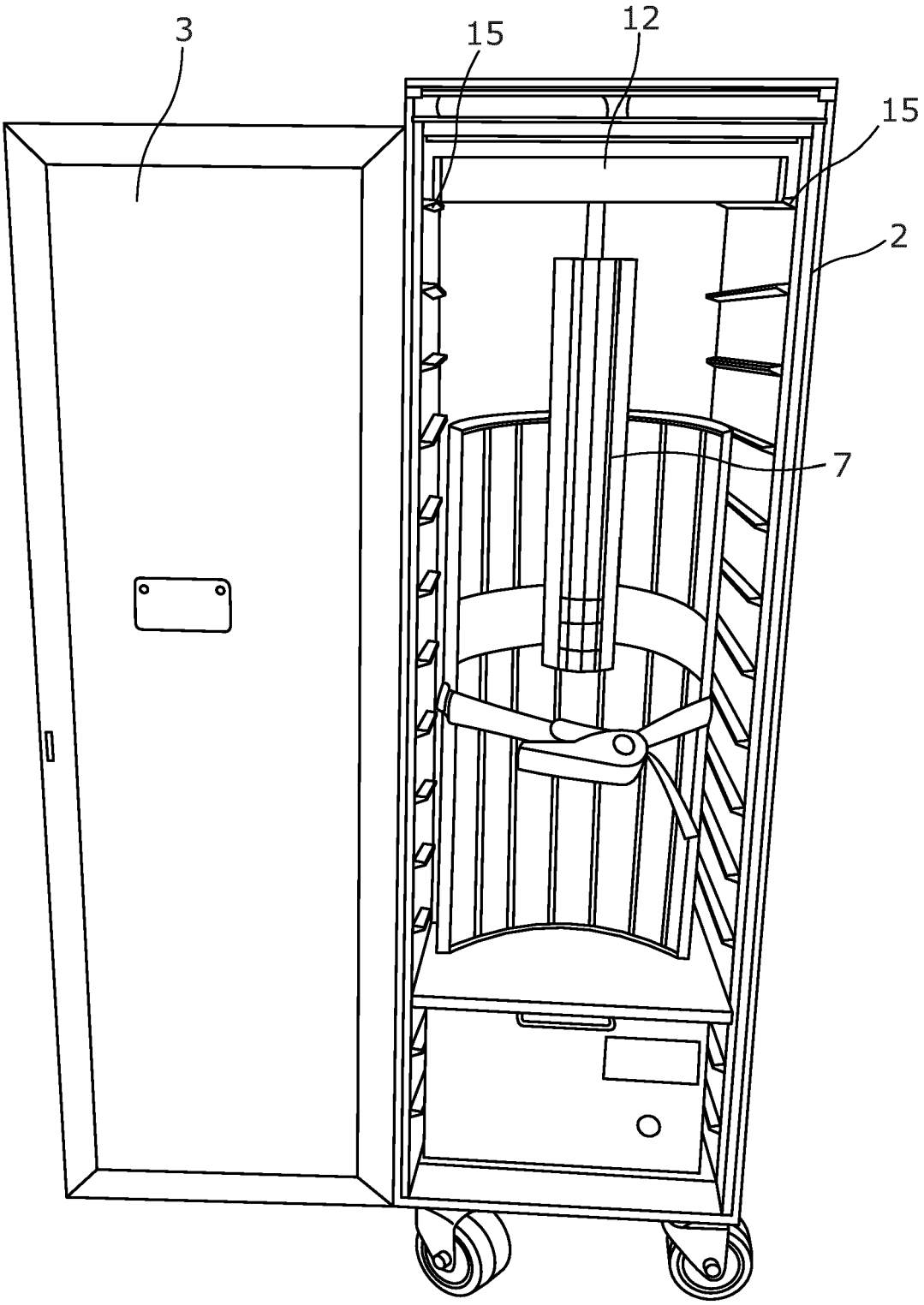

Fig. 12

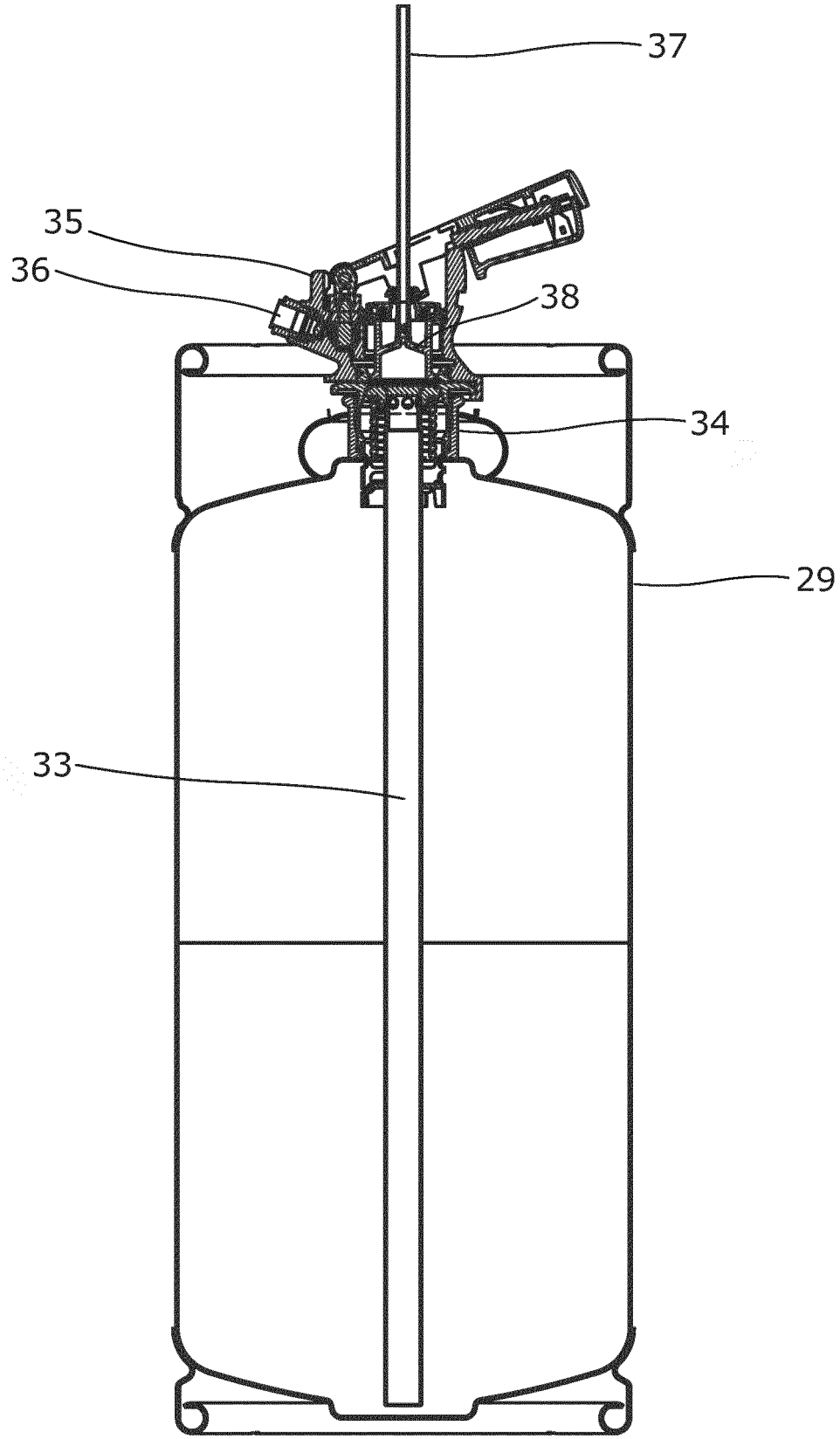

Fig. 13

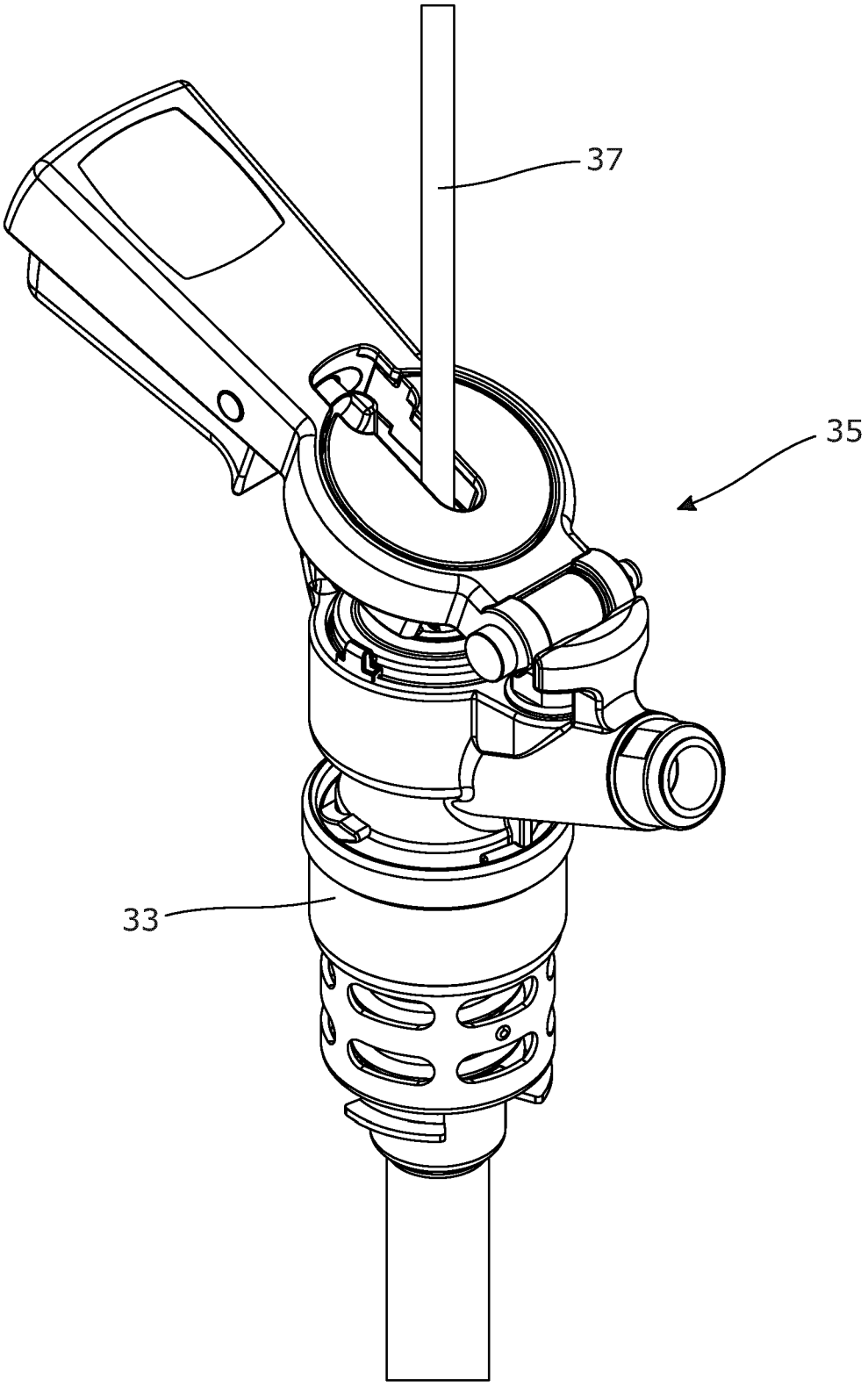

Fig. 14

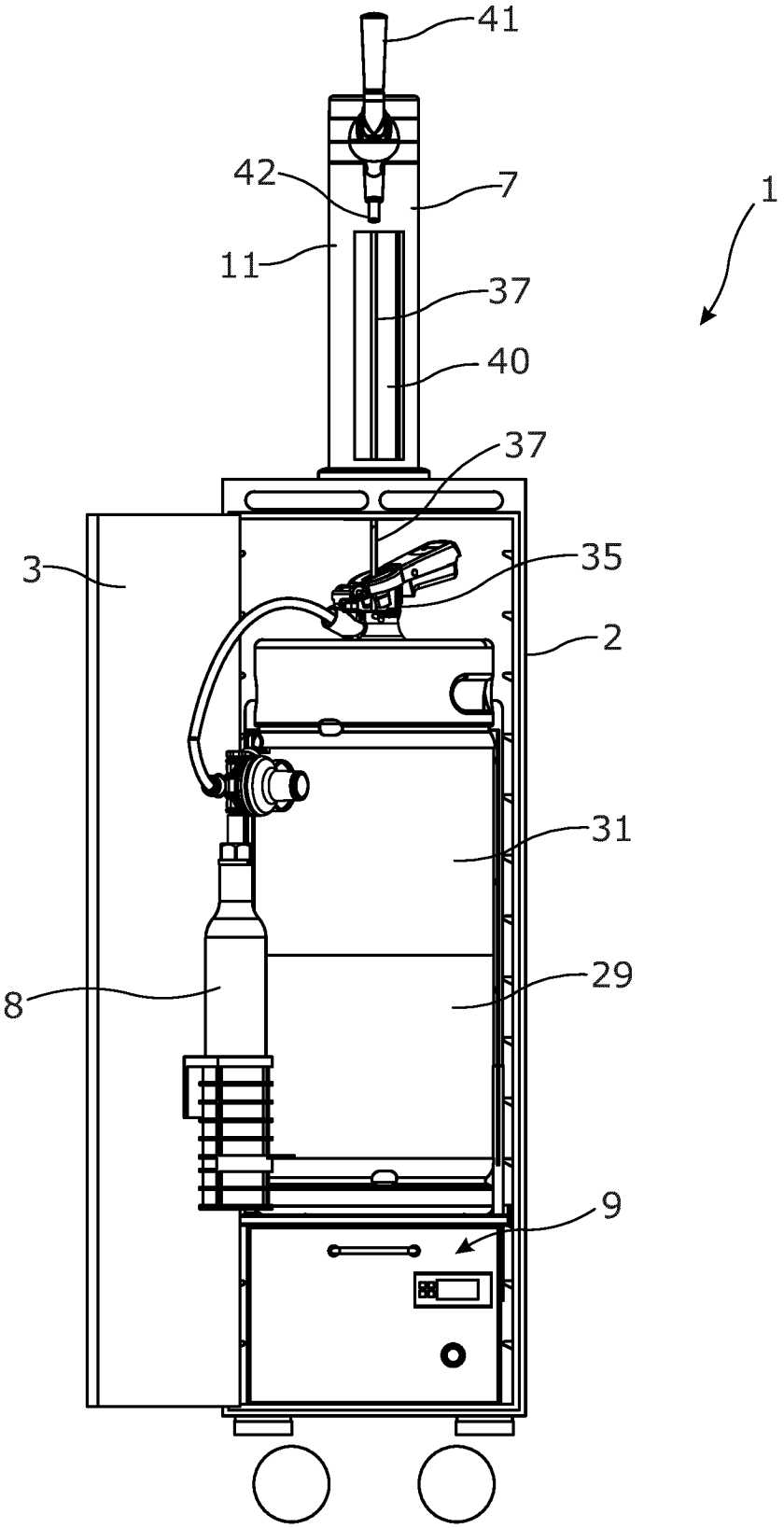

FIG. 15

REFERENCES CITED IN THE DESCRIPTION

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